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POSTERS

1 Early 'real world' data on dapagliflozin: effective glucose control, blood pressure reduction, weight loss and reduced medication burden.

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Background: Dapagliflozin is the first medication in the new class of sodium-glucose cotransporter 2 (SGLT2) inhibitors licensed in the UK. Improved glycaemic control and weight loss have been demonstrated in pre-licensing clinical trials but effectiveness in clinical practice has not yet been reported.

Design and Setting: We performed a retrospective case-note audit of all patients started on dapagliflozin in the diabetes outpatient specialist clinic of a London hospital.

Method: The audit was performed using data collected during routine clinical follow-up. Data was collected on side-effects, discontinuation of dapagliflozin, changes in HbA1c, weight, and blood pressure, and ongoing use of other diabetes medication. Patients were followed up for up to a year. We performed a logistic regression analysis to identify predictors of improvement in HbA1c and weight loss.

Results: 96 people were included in the final analysis. 42% had an HbA1c reduction ≥ 1%; 29% had no reduction. 15% had weight loss ≥5kg; three (3%) had weight loss ≥10kg; and 24% people had no weight reduction. Genital candidiasis, nocturia, and polyuria were the most common adverse effects. The rate of discontinuation of dapagliflozin due to side effects (22%) was higher than that reported in trials (3-4%). 36 (38%) of people tolerating dapagliflozin were able to stop or reduce one or more other diabetes medication.

Conclusions: Dapagliflozin is effective in real world clinical practice. It has additional benefits beyond glycaemic control; reduction of blood pressure, weight loss, and reduced need for concomitant diabetes medications. However dapagliflozin is not as well tolerated in real world patients as in participants of clinical trials.

2 Role of Urine C-Peptide Creatinine ratio in the management of Diabetes.

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Introduction:
C-Peptide is produced in equal amounts to insulin and is the best measure of endogenous insulin secretion. With the rise in prevalence of Type 2 DM and increasing recognition of monogenic subtypes of diabetes (MODY) in younger patients, the measurement of insulin secretion is relevant in clinical practice. (2) C-Peptide level must be interpreted with caution in renal failure, approximately half of C-Peptide produced is removed by kidney.

Methodology:
This audit aims to review whether urine C-Peptide measurement helped in the management of adult and paediatric patients with diabetes. It was retrospective study. We found that 38 patients had UCPCR test, from 01/01/2012 to 31/12/2013 (2 years).We did not address the use of C-Peptide in the assessment of hypoglycaemia.

Results:
The analysis of data showed that it helped in management plan for 36 patients and confirmed diagnosis in 30 patients. All the 38 patients had renal function checked before this test. All normal except one with eGFR 58. We found that 5 patients had deranged LFTs pre UCPCR test. UCPCR was requested once only for all patients.19 patients had auto antibodies checked and one patient had genetic testing for MODY. 25 patients had UCPCR measured within 5 year of diagnosis and 13 patients, after 5 years of diagnosis.

Conclusions:
Utility is greatest in the long standing diabetes as there may be overlap of C-Peptide levels between 2 types at the time of Diagnosis. In type 1 Diabetes, insulin/c-peptide levels rapidly fall, therefore utility of this test increases from 3 to 5 years post diagnosis. (1)

This test is helpful to differentiate between MODY and Type 1 DM, as persistence of C-Peptide level is an important feature of MODY. (5).

The awareness that a patient has absolute insulin deficiency (low c-peptide level) is important to clinical management and determining prognosis. (4).

It may be helpful to diagnose adult patients presenting with DKA, who do not have classical Type 1 diabetes (ketosis prone Diabetes) and may not require long term insulin treatment.

C-Peptide may help to identify insulin treated patients with sufficient Beta cell function to replace insulin with other oral hypoglycaemic agents.(5). There may be an additional role to exclude severe insulin deficiency prior to addition of sulphonylureas and GLP-1 agonist to insulin.

Key Message:
If c-peptide level taken within the first few years of diagnosis, may be useful in confirming Type 1, however higher results should be interpreted with caution.

References:

1)Besser RE, Ludvigsson J, Jones AG, McDonald TJ, Shields BM, Knight BA et al. Urine C-peptide creatinine ratio is a noninvasive alternative to the mixed-meal tolerance test in children and adults with type 1 diabetes. Diabetes Care 2011; 34: 607–609.

2)Besser RE, Ludvigsson J, Jones AG, McDonald TJ, Shields BM, Knight BA et al. Urine C-peptide creatinine ratio is a noninvasive alternative to the mixed-meal tolerance test in children and adults with Type 1 diabetes. Diabetes Care
3)Ludvigsson J, Carlsson A, Forsander G, Ivarsson S, Kockum I, Lernmark A et al. C-peptide in the classification of diabetes in children and adolescents. Pediatr Diabetes 2012; 13: 45–50.
4)Sari R, Balci MK. Relationship between C peptide and chronic complications in type-2 diabetes mellitus. J Natl Med Assoc 2005; 97: 1113–1118.
5)The clinical utility of C-peptide measurement in the care of patients with diabetes-A. G. Jones1,2 and A. T. Hattersley1,2(Diabetes UK13)

3 The burden and development of clinically significant chronic liver disease in older people with type 2 diabetes: The Edinburgh Type 2 Diabetes Study.

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Introduction
We aimed to describe the burden of chronic liver disease (CLD) amongst community-based older people with type 2 diabetes and to determine whether a wide range of risk factors and biomarkers might assist in discriminating those patients who go on to develop clinically significant CLD.

Methods
939 participants in the Edinburgh Type 2 Diabetes Study underwent extensive liver assessment including liver ultrasound and a wide range of serum/plasma markers. In addition diabetes history, metabolic factors, systemic inflammation and non-invasive markers of steatohepatitis and hepatic fibrosis were measured. Over 6 years cases of clinically significant CLD (cirrhosis, hepatocellular carcinoma) were recorded from linkage to patient records.

Results
During the follow-up period 36 patients had either new or existing CLD: 35 (3.7%) cases of cirrhosis, 9 (1.0%) HCC's and 11 (1.2%) cases of oesophageal varices.
Eight patients were diagnosed before the study commenced, 13 immediately following the liver assessment and 15 more during the follow-up period (incidence rate 2.9/1000 person-years).
Less than half (n=7) of those developing incident CLD were identified by the extensive liver assessment. Abnormal liver enzymes (IRR5.7, 95%CI2.0-16.0, p=0.001) were associated with the development of CLD however the presence of hepatic steatosis was not.
Higher marker levels of systemic inflammation, steatohepatitis and hepatic fibrosis were also associated with developing incident CLD.

Conclusion
Over a 6-year period the incidence of CLD was lower than anticipated but still much higher than the general population. The ability to identify patients at risk of progression of liver disease allows early intervention strategies and guides clinical monitoring and follow-up. Further work looking at a longer time period and analysing rates of liver function decline are in progress to provide optimal identification tools.

4 Stress Hyperglycaemia in Hospitalised Patients and Their 3-Year Risk of Diabetes: A Scottish Retrospective Cohort Study.

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PLEASE SEE
http://www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.1001708
FOR MORE DETAILS/FIGURES etc

Aims
Hyperglycaemia during a hospital admission is common in people without known diabetes and is associated with adverse outcomes. However, the subsequent risk of type 2 diabetes is unknown.
We linked a national register of patients with diabetes (SCI-DC), a national hospitalisation database and regional biochemistry results databases in order to describe the association between admission venous glucose and subsequent 3-year risk of type 2 diabetes.
Methods
Patients aged 40 years or older with an emergency admission to hospital between 2004 and 2008 were included. Prevalent diabetes and incident diabetes were identified via SCI-DC and patients with prevalent diabetes (diagnosed on or before 30 days after the date of discharge from hospital) were excluded.
The predicted 3-year risk of type 2 diabetes by admission glucose, age and sex was obtained from logistic regression models.
Results
In 86,634 (71.0%) patients aged 40 and older the 3-year risk of developing type 2 diabetes was 2.3% (1,952/86,512) overall, was <1% for a glucose ≤5 mmol/l, and increased to approximately 15% at 15 mmol/l. The risks at 7 mmol/l and 11.1 mmol/l were 2.6% (95% CI 2.5–2.7) and 9.9% (95% CI 9.2–10.6), respectively, with one in four (21,828/86,512) and one in 40 (1,798/86,512) patients having glucose levels above each of these cut-points.
Conclusions
Information about glucose levels during a hospital admission can be used to estimate risk of subsequent diabetes and inform guidelines for follow-up of people with hyperglycaemia.

5 Urinary Proteomics for Diagnosis of Nephropathy and Subclinical Vascular Damage in Type 2 Diabetes.

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Background.
We have previously described a urinary proteomic classifier (CKD273) for diagnosis and prediction of diabetic nephropathy (DN). Whether CKD273 only highlights renal damage or also reflects generalised vascular damage in patients with diabetes remains unclear.

Methods.
We recruited 45 Type 2 diabetic patients: 15 normoalbuminuric; 15 with MA and 15 with DN: albumin:creatinine ratio 1.1 (0-3.3), 7.7 (2.6-22.5), 124.5 (0.8-412.6) mg/mmol; estimated glomerular filtration rate (eGFR); 74 (46-125), 69 (49-100), 37 (6-60) ml/min/1.73m2. Participants underwent pulse wave analysis assessment of heart-rate corrected augmentation index (AIx@75) and ultrasound measurement of carotid intima-media thickness (c-IMT). Urine samples were analysed using capillary electrophoresis coupled to mass spectrometry (CE-MS).

Results.
There was no difference in age (61±8, 64±6 and 59±7 years; p=0.130), body mass index (34.4±6.2, 35.1±8.1, 34.4±6.7 kg/m2; p=0.955) or blood pressure (144±15/83±7, 149±20/83±10, 148±16/82±12 mmHg; p=0.765/0.910) between groups. Participants were at high CV risk (Framingham score: 30±11, 38±12, 32±12; p=0.141; ASSIGN score: 36±15, 43±15, 39±17; p=0.415) and had subclinical vascular damage (AIx@75: 22 (7-38), 23 (13-21), 25 (4-35)%; p=0.993; c-IMT: 0.723 (0.563-1.276), 0.760 (0.614-1.082), 0.704 (0.581-0.986)mm; p=0.305) independent of eGFR (r=0.259, p=0.086 for c-IMT; r=0.082 p=0.598 for AIx@75). Despite similar CV risk and vascular phenotypes the CKD273 classifier was significantly different between the groups (-0.169±0.373, 0.421±0.467, 0.765±0.434; p=0.002) but not related to c-IMT(r=0.075, p=0.747) or AIx@75 (r=-0.299, p=0.200).

Conclusions.
CKD273 distinguished normoalbuminuria from MA and DN independent of vascular phenotype. Neither traditional renal markers nor a novel proteomic classifier appear to fully explain the vascular damage in our cohort.

6 Diabetes Mellitus, Statins and devastating myopathy.

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We report a 50 year-old gentleman of Asian ethnicity, with known Type 2 Diabetes Mellitus, Hypertension and Hypercholesterolaemia. He presented with a 3 month history of worsening myalgia, generalised weakness, fatigue, fever, night sweats, dysphagia and 4kg weight loss. His medications included Simvastatin, Ramipril, Amlodipine and Metformin.

He had numerous presentations to his GP in the preceding months and was treated as a viral illness. He subsequently could not walk and was severely debilitated hence was referred to A&E where he was assessed. Examination revealed markedly reduced power in the proximal muscles bilaterally with normal power in peripheral muscle groups. Sensation, reflexes and tone were normal. His Creatinine Kinase was grossly elevated at 24,514iu (40-320iu/L). Investigations ruled out TB. EMG revealed myopathic changes with an acute inflammatory response in the proximal muscles. MRI of the muscles showed oedema and muscle biopsy confirmed a severe acute myopathy with necrosis and myophagocytosis. Serum 3-hydroxy-3-methylglutaryl-coenzyme-A (HMG-Co-A) antibody was positive. The patient later confirmed that his symptoms gradually began after commencing Simvastatin.

Treatment was initially with IV methyprednisolone and subsequently high dose prednisolone followed by intravenous immunoglobulin. He recovered fully over the next 2-3 months.

Whilst myopathy is a rare side-effect of statins, drug cessation may not result in symptom relief if the patient has developed autoantibodies to HMG-Co-A reductase. Patients and clinicians should be aware of the side effects of statins and weigh their risks and benefits. Should statins be used as primary prevention in all patients with diabetes?

7 Best in class insulin prescription charts.

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The National Diabetes Inpatient audit (NaDIA) 2013 has exposed insulin related prescription errors in over 20% of patients. Good prescription charts can reduce these.

The Joint British Diabetes Societies for Inpatient care (JBDS) organised a national competition for the 'best in class' insulin prescription chart. The aim was to find safe and effective insulin charts in use and facilitate their availability to the other teams across the UK. A total of 41 trusts submitted their charts. The quality of these charts were judged by an expert panel of independent judges according to predefined criteria based on National Patient Safety Association (NPSA) guidelines 2010 on the safe prescription of insulin.

The charts from Nottingham University Hospitals, East Sussex Healthcare, Worcestershire Royal Hospital and Western Sussex Hospitals were declared winners.

Comments on the strengths of winning charts included –'very practical three page fold-out', 'uncluttered' 'easy to understand', 'inclusion of sc insulin in main drug chart', 'separate charts for the various IV regimens', 'inclusion of pre admission regimen', 'storage advice on chart', 'advice on moving insulin WITH patients and self-administration', 'advise on non return valves for iv insulin infusion' and 'instruction on making up IV infusion.'

Suggestions for improving the charts included 'prescribing by brand name', 'integrated blood glucose monitoring', 'chart for hyperkalaemia', 'colour coding for different charts', 'better guidance on when to start which regimen', 'better reference to units (rather than U) and 'adequate space for monitoring and dose changes.'

The winning charts will be displayed on the poster.

8 Experience of Tresiba at Guy's and St Thomas' Hospital.

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We present our experience of patients using Tresiba at Guy's and St Thomas' Hospital since its launch.

24 patients were treated over 15 months. 18 had type 1, 3 type 2 and 3 pancreatic failure. Mean age was 46 (range 19-75) and duration of diabetes 18 years (1- 48). Tresiba was started for adherence issues and hyperglycaemia in 17 cases; recurrent hypoglycaemia in 6; and to facilitate flexible injection timing for 1. HbA1c at initiation was 11.1 ± 2.7% (98 ± 17.5mmol/mol, mean ±SD). After a mean of 10 months follow-up, HbA1c was 11.1 ± 3.0% (98 ± 21mmol/mol, p=0.98).
Of 5 patients with recurrent admissions with DKA in 12 months prior to Tresiba, 1 experienced reduced frequency (1 every 1.2 months to 1 every 3.4 months), 1 an increase (1 every 3 months to 1 every 1.6 months) and 3 have insufficient follow-up time. 1 patient was admitted with a prolonged, severe hypoglycaemia.
Of 6 patients switched to Tresiba to reduce hypoglycaemia, 3 reported no improvement, 1 an increased frequency of severe hypoglycaemia and 2 an improvement.

Among these 24 patients, there are those who have experienced a reduction in extremes of glycaemia. Conversely, some have seen an increase and for the majority there has been no objective change. The occurrence of a severe, prolonged hypoglycaemia in one patient should serve as a cautionary note on using ultra-long acting insulin in patients at increased risk, e.g. with hypoglycaemia unawareness, social isolation or with alcohol or drug misuse.

9 Insulin Degludec, an alternative to Insulin U500, in severe insulin resistance due to antibodies.

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Case report
we report 56 year old Asian male,diabetes from age 26. He had a strong family history of diabetes (both parents and brother).
Given Mixtard Insulin in addition to OHAs after his myocardial infarction in 2011.. His weight was 62 kg. Insulin doses were uptitrated and preparations were changed to maintain the HbA1c around 8-9%. Insulin U100 treatments comprised: Novomix 30, Glargine/Novorapid, Humalog Mix 50 and also a combination of Detemir/Humalog Mix 50.

In 2011, the U100 insulin requirement increased to 3.8 U/KG (300 units a day). His insulin antibodies were positive at 27 (0-5 mg/L).He was changed to Insulin U500 to reduce the injection volume and improve absorption. After initial good response dose were titrated to 35/20/30 units per day (insulin 425 units/day).

In 2013, he was changed to Insulin Degludec U200 at total 62 Units once a day, with improvement in glycaemic control HbA1c reduced to 9%.from 11% His insulin antibody levels normalised to 3.2(0-5) mg/Land his weight remained stable. The reduction in cost was insulin Degludec £120/month vs U500 insulin £200/month

Conclusions
Insulin Degludec is new long acting insulin analogue with a distinct pharmacokinetic and pharmacodynamic profile. It has proved to be less immunogenic and associated with resolution of insulin resistance. Also significant reduction in dose, volume and frequency of injection, with overall improvement in glycaemic control and reduced drug cost
Our case report suggests that insulin Degludec U100/200 could be considered in severe insulin resistance.

10 A Final Resolution Following Years of Polypharmacy.

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We describe a 61 year old, previously healthy Caucasian man, who presented with abdominal pain, general tiredness and refractory hypertension. He was already being treated with an ACE inhibitor, calcium channel blocker and had recently been started on diuretics. However, his blood pressure was elevated, ranging from 154/90mmHg to 175/98mmHg. He was becoming more frustrated and disillusioned with polypharmacy and his persistently uncontrolled blood pressure despite full compliance with medical advice. He was extensively investigated by local gastroenterologists for his dyspeptic symptoms who reported a normal oesophagogastroduodenoscopy and colonoscopy. A Computerised tomography scan incidentally revealed a 1.5cm right-sided adrenal adenoma for which he was referred to the Endocrine team.

Further investigations revealed a raised plasma aldosterone/renin ratio, consistent with primary hyperaldosteronism (Conn's Syndrome). Adrenal vein sampling, however, revealed that aldosterone levels were raised on the contralateral side and therefore surgical options were not deemed suitable. Spironolactone was commenced on cessation of all

antihypertensive medication and he has remained normotensive (Mean BP 110/78mmHg). Our patient has developed a small degree of gynaecomastia, a well-known side effect of Spironolactone, but there was no cause for medical or personal concern. He is delighted that his BP is now controlled on only one medication.

Asymptomatic primary hyperaldosteronism (Conn's syndrome) is being increasingly diagnosed as a cause for hypertension. This case demonstrates the need to further investigate the causes of hypertension, in particular unremitting hypertension with polypharmacy.